

ZOOLOGICAL SOCIETY.

June 24, 1856.—Dr. Gray, F.R.S., in the Chair.

DESCRIPTION OF MYGALE EMILIA, A SPIDER FROM PANAMA, HITHERTO APPARENTLY UNRECORDED. BY ADAM WHITE, ASSISTANT IN THE ZOOLOGICAL DEPARTMENT, BRIT. MUS.

The large Spiders of the New World, though generally sombre in hue, are occasionally varied in colour. The *Mygale versicolor* described by Baron Walckenaer (Apt. i. 211), has the cephalothorax covered with down-like hairs of a metallic green lustre, and some of the hairs of the body have in certain aspects a violet reflection. The *Mygale rosea* described by the same author from the collection of M. Guérin-Ménéville, who procured it from Chili, is deserving of its specific name. The *Mygale Zebra*, figured in the fourth volume of the 'Annales de la Soc. Entomologique,' pl. 19, has the abdomen strikingly striped. Generally speaking, however, these large *Mygales*, whether from the Old or the New World, are rough, plain brown, or black creatures, with greyish scattered hairs. Since Walckenaer's work was published in 1837, several species have been added to zoological science, especially in the German work of Koch. The following species, pre-eminent for its striking beauty of colour, was obtained by my friend Dr. Berthold Seemann, the distinguished naturalist who succeeded Mr. Edmonstone on board H.M.S. Herald under Capt. Kellett, R.N., C.B.

I have but once seen a *Mygale* alive; the specimen was sent to the late Mr. John Doubleday by post, and when it reached London was evidently much shaken by its transit from Liverpool. The day after its arrival he gave it cockroaches. They were put into the small box along with the *Mygale*. It apparently at first did not see them, but on these "Cursorial Orthoptera" running about *Mygale's* legs, the great spider drew itself up, and darted its chelicera into one of them, tearing its intestines with its fearfully armed hook. The *Blatta* was soon devoured, and the spider, evidently an invalid after its rough journey, died next day.

Mr. H. W. Bates, who has for the last eight years so successfully collected *Annulosa*, and observed their habits at various points on the Amazon, in a letter to me, dated "Santarem, 30 April, 1855," written on the eve of starting for "the wonderful country of the Upper Amazons," remarks:—"With regard to spiders, I have observed many curious points in their habits, but I cannot communicate them until I can send specimens, with numbers attached, to which the notes can be referred. There is one observation I made, however, which I am sure will be of the highest interest to science. It is with respect to the habit of the *Mygales* to prey on birds. Now I have detected them in the fact as far back as 1849, but thought little of it at the time, as I had the idea that it was a well-known and undisputed fact in science. Lately, however, I read an account (I think of Langsdorff's expedition in the interior of Brazil), where

the fact is considered to rest on no foundation, and to be one *more* of the fables originated by Madame Merian. Now I will relate to you what I saw. In the month of June 1849, in the neighbourhood of Cameta, I was attracted by a curious movement of the large grey-brown *Mygale* on the trunk of a vast tree. It was close beneath a deep crevice or chink in the tree, across which this species weaves a dense web, open for its exit and entrance at one end. In the present instance, the lower part of the web was broken, and two pretty small finches were entangled in its folds; the finch was about the size of the common Siskin of Europe, and I judged the two to be male and female: one of them was quite dead, but secured in the broken web; the other was under the body of the spider, not quite dead, and was covered in parts with the filthy liquor or saliva exuded by the monster. I was on my return from a day's excursion by land, at the time, with my boxes full of valuable and delicate insects, and six miles from my house, and therefore could not have brought the specimens home, even had I wished, which I did not, as the species was a very common species, easily to be procured nearer home.

“If the *Mygales* did not prey upon Vertebrated animals, I do not see how they could find sufficient subsistence. On the extensive sandy campos of Santarem, so bare in vegetation, there are hundreds of the broad slanting burrows of the large stout species (that fine one, dark brown, with paler brown lines down the legs). The campos, I know, from close research, to be almost destitute of insects, but at the same time they swarm with small lizards, and some curious ground-finches of the *Emberiza* group (one of which has a song wonderfully resembling our Yellow-bunting of England), besides which vast numbers of *Caprimulgi* (*C. psalurus*, Azara) and ground-doves lay their eggs on the bare ground. I believe this species of *Mygale* feeds on these animals and their eggs at night. Just at close of day, when I have been hurrying home, not liking to be benighted on the pathless waste, I have surprised these monsters, who retreated within the mouths of their burrows on my approach.”

MYGALE EMILIA.

M. nigro-fusca, cephalothorace, duobusque articulis singulorum pedum late flavescenti-rubris.

Deep blackish-brown; the basal joint of chelicera with some scattered red hairs in front; the cephalothorax of a rich yellowish-red, the hairs short, close and velvet-like; the fourth and fifth joints of the legs clothed with yellowish-red hairs, the end of the fifth joint with many brown hairs; fourth joint of the first pair of legs, with the curiously hooked process near the end, also covered with red hairs, the under side of the fifth and sixth joints and the tarsi clothed with a close, dense, velvet pad. Body brown, with longish, scattered red hairs, which are deeper in hue than on the other parts.

July 8, 1856.—Dr. Gray, F.R.S., in the Chair.

ON THE LAND AND FRESHWATER SHELLS OF KASHMIR AND
TIBET, COLLECTED BY DR. T. THOMSON.
BY S. P. WOODWARD, F.G.S.

These shells, which I received through Dr. J. D. Hooker and Sir Charles Lyell, were collected by Dr. Thomson in 1847–8, when he accompanied Major Cunningham and Capt. H. Strachey in “one of the most adventurous journeys ever made in the Himalaya*.”

The shells of continental India are nearly all distinct from those of Europe, and although far inferior in beauty and variety to those of the Asiatic Islands, have yet a marked character, owing to the admixture of tropical forms and especially to the great development of the operculated genera (*Cyclostomidæ*), which are almost unknown in our quarter of the world †.

It was, therefore, a matter of considerable interest to ascertain what land and freshwater shells occur in the remote regions of Kashmir and Tibet; and somewhat surprising to find, that of about 22 sorts collected by Dr. Thomson, one-half were British species, and the rest of the commonest and most widely diffused Indian forms.

The species marked * are European.

- * *Helix pulchella*, small var., *subfossil*. Iskardo, Tibet (Europe, N. America).
- * — *costata*, large var., recent. Iskardo, 7200 feet.
- * *Helicella nitida*. Near Iskardo (Europe, N. America).
- Bulimus candelaris*, Pfr. Takht i Suliman, Kashmir.
- *segregatus*, small var. Kashmir.
- * *Zua lubrica (subfossil)*. Iskardo (Europe, N. America).
- Pupa Huttoniana*, Benson. Iskardo (also *subfossil*).
- * *Succinea Pfeifferi*, var. (*longiscata*, Morillet?). Kashmir.
- * *Limnæa stagnalis*. Kashmir (Europe; N. America, Oregon).
- * — *peregra*. Pitak, Tibet; Kashmir.
- , var. *Hookeri*. Iskardo and Nubra, Tibet (18,000 feet).
- * — *auricularia*. Iskardo; Thogji Lake (*subfossil*).
- , sp. Kashmir (resembling the Australian *L. simulata*).
- * — *truncatula*, Müll. Iskardo, in damp moss (also found at Candahar, Afghanistan; at Madeira, and in the U. States).
- *luteola*, Lam. (*succinea*, Dh.). Islamabad, Kashmir (also Prome, Burmah).
- *acuminata*, Lam. Jamu hills.
- Planorbis Coromandelicus*, Fabr. Jamu hills; Islamabad, Kashmir (also Ceylon and Malacca).
- *nanus*, Benson; *subfossil*. Tsoral Lake, Tibet (Capt. H. Strachey).
- , sp. Pitak and Iskardo; Tertse, Nubra, in lacustrine clay.

* Western Himalaya and Tibet; a Journey through the Mountains of Northern India. By Dr. Thomas Thomson. 8vo, London, 1852.

† Mr. Benson states that *Helix Bactriana* (Hutton), found in Afghanistan, is closely allied to the European *H. strigella*.

Paludina Bengalensis, var. Jamu hills, Kashmir.

**Valvata piscinalis* (subfossil). Kashmir; Tsoral Lake, Tibet.

**Cyrena fluminalis*, Müll.* (*Cashmiriensis*, Dh.). Avantipura, Kashmir.

Cyclas (*Pisidium*), sp., subfossil. Thogji Lake, Tibet.

These specimens have been submitted to the examination of Mr. W. H. Benson, who is unsurpassed in his critical acquaintance with Indian shells, and especially those of the Western Himalaya.

Helix pulchella and *Zua lubrica* were only obtained in the condition of "dead shells" from the alluvial plains of Iskardo and Kashmir.

The *Pupa* and *Bulimus candelaris*, *Limnæa auricularia* and *Valvata piscinalis*, were found both recent and subfossil.

Limnæa auricularia occurred in prodigious abundance in the alluvial clay around the salt-lake of Thogji, at the height of 150 feet above its present level. There are no longer any living shell-fish in its waters, and Dr. Thomson remarks, "it may fairly be inferred that the lake was quite fresh at the time when it was inhabited by *Limnæa*." The increase of the height of the surface of the water to the small amount of 150 feet, appears to have admitted of its discharging its waters along the course of an open valley into one of the tributaries of the Zamkar river (p. 173).

Everywhere to the northward of Tibet, from the Aral Sea to Chinese Tartary, is a country of small salt-lakes having no outlet; and this region divides Northern India from the Siberian steppes, in which land and freshwater shells of *Germanic species* are known to occur.

Westward, however, the ranges of the Hindoo Koosh are prolonged through Persia to the Caucasus, and form a continuous route to the Lusitanian region.

Since the shells which have been mentioned as English species occurring in Tibet, are also common to the South of Europe, they are rather to be regarded as *Lusitanian* than *Germanic species*.

The land species (*Zua*, *Helix*, *Helicella* and *Succinea*) are, however, amongst the most ancient inhabitants of this island, being found in the newer-pliocene deposits of the Thames valley, associated with the same *Valvata* and the same species of *Cyrena*, and with remains of an Elephant (*E. meridionalis*) and a Rhinoceros (*R. leptorhinus*), which are not only extinct, but were succeeded by other races of the same animals (*Elephas primigenius* and *Rhinoceros tichorhinus*), before they finally disappeared from this portion of the globe.

If, therefore, the small land shells of our newer tertiaries originally migrated into this country from the East, we must ascribe to their occupancy of the lofty plains of Kashmir and Tibet a very high

* Varieties of this shell are found in Sicily, Palestine, the Nile, and all the rivers of the East. These varieties have been regarded as constituting about twenty distinct species; e. g. *C. Euphratica*, Bronn; *ambigua*, Dh.; *Cor*, Lam.; *consobrina*, Caill.; *triangularis*, Dh.; *Panormitana*, Bivon, &c. When fossil, it is the *C. trigonula*, Searles Wood; *C. Gemmellarii*, Phi.

antiquity compared with any of the monuments which Man himself has reared, even in the country most usually regarded as the cradle of his race.

ON THE SPECIES OF THE AMERICAN GENUS *PARRA*.
By PHILIP LUTLEY SCLATER, M.A., F.Z.S.

The American birds of the genus *Parra*, together with their representatives in the Tropics of the Old World belonging to the genera *Metopidius*, *Hydralector* and *Hydrophasianus*, constitute a very natural group, allied in many respects to the *Rallidæ*, but remarkable for the extreme elongation of the toes—a formation beautifully adapted for enabling them to walk upon the floating leaves of the numerous water-plants of these countries.

MM. Verreaux of Paris have kindly furnished me from their well-stored magazines with a series of specimens of *Parra*, which enabled me to point out to the Society the distinctions between all the hitherto known species of this genus, and to indicate one certainly new, and a second, which although not so obviously distinct, has some claim to be recognized as an intermediate species.

A. *Species caruncula frontali bilobata et caruncula rictali utrinque præditæ.*

1. *PARRA JACANA.*

Parra jacana et variabilis, Linn. et Gm.

Parra nigra et brasiliensis, Gm.

Parra jacana, Max. Beitr. iv. 786.

Parra jassana, Schomb. Reise, iii. 759.

Jacana du Mexique, Buff. Pl. Enl. 322 (adult).

Jacana du Brésil, Buff. Pl. Enl. 846 (juv.).

Capite toto cum cervice supera et corpore infra nigris: dorso, alis caudaque clare castaneis: tectricibus caudæ superioribus purpurascente tinctis: remigibus flavescenti-viridibus, nigro extus partim marginatis: hypochondriis et tectricibus subalaribus intense castaneis.

Hab. South-eastern Brazil (*P. Max.*); British Guiana (*Schomb.*); Cayenne; ins. Trinidad.

The examples of this bird which I have seen from Guiana and Cayenne appear to be considerably inferior in size to the Brazilian specimen, but I am not yet certain how far this may be due to sexual differences.

2. *PARRA INTERMEDIA*, sp. nov.?

“*Parra intermedia*, Bp.,” J. et E. Verreaux, MS.

Capite toto cum cervice supera et corpore infra nigris: dorso, alis caudaque obscurius castaneis, purpurascente paululum tinctis: hypochondriis et tectricibus subalaribus brunnescenti-castaneis: remigibus flavescenti-viridibus, nigro extus partim marginatis.

Hab. Venezuela (*Verreaux*).

This bird is hardly distinguishable from the *P. jacana*, except by the browner and more purplish tinge of the back, in which respect it seems intermediate between that species and *P. melanopygia*.

I should hardly have ventured to separate it specifically on my own authority; but, as the MS. name has attained circulation, I think it right to point out the apparent differences.

3. PARRA MELANOPYGIA, sp. nov.

Capite toto cum cervice supera et corpore infra nigris : interscapulio, alis caudaque purpurascenti-brunneis : dorso imo et tectricibus caudæ superioribus nigris : hypochondriis et tectricibus subalaribus nigris : remigibus flavescenti-viridibus, nigro extus partim marginatis.

Hab. S. Martha in New Grenada (*Verreaux*).

MM. Verreaux's specimens of this bird are labelled *P. hypomelæna*, but that name is properly applicable to the next species.

4. PARRA HYPOMELÆNA.

Parra hypomelæna, Gray & Mitch. Gen. of B. pl. 159.

Nigra : alis fusco-nigris purpurascente tinctis : remigibus flavescenti-viridibus, nigro extus partim marginatis.

Hab. New Grenada, S. Martha (*Verreaux*); Bogota (*Mus. Brit.*); Cartagena (*Mus. Paris.*); Chiriqui, Panama (*Bridges*).

B. Species caruncula frontali trilobata : carunculis rictalibus nullis.

5. PARRA GYMNOSTOMA.

Parra gymnostoma, Wagl. Isis, 1831, p. 517.

Parra cordifera, Less. R. Z. 1842, p. 135; Desmurs, Icon. Orn. pl. 42.

Capite toto cum cervice supera et infra ad medium pectus nigris, æneo micantibus : dorso toto alisque castaneis : uropygio purpurascente : abdomine purpurascenti-brunneo : remigibus flavescenti-viridibus, nigro marginatis.

Hab. Southern Mexico; Mazatlan (*Mus. Brit.*); Acapulco (*A. Lesson*); New Grenada, S. Martha (*Verreaux*); Honduras (*Dyson*).

Wagler's accurate diagnosis of this bird has been generally passed over, and Lesson's more recent appellation is commonly employed for this species.

November 11, 1856.—Dr. Gray, F.R.S., in the Chair.

ON A NEW SPECIES OF SQUIRREL (*SCIURUS MACROTIS*) FROM BORNEO. BY J. E. GRAY, Ph.D., F.R.S. ETC.

Among the specimens of animals which the British Museum has lately received from Mr. Wallace from Sarawak, is a large, well-marked species of Squirrel, particular for having very large, longish pen-

cilled ears like the European species, with a broad white streak on the upper part of each side, and a very broad full tail, grizzled, with large white tips to the hairs.

SCIURUS MACROTIS.

Ears large, with a large pencil of elongate hairs. Dark chestnut-brown, very minutely grizzled with pale tips to the hairs. Rump, outside of thighs and base of tail redder; point of thighs bright bay; feet blackish; upper part of the side with a broad pale streak; cheeks and inner side of legs paler; chin, throat, and beneath white; tail very broad, with very long white-tipped hairs.

Length 13, tail 11 = 24 inches.

Hab. Sarawak (*Mr. Wallace*).

OBSERVATIONS ON A LIVING AFRICAN LEPIDOSIREN IN THE CRYSTAL PALACE. BY J. E. GRAY, Ph.D., F.R.S. ACCOMPANIED BY A NOTE FROM MR. A. D. BARTLETT.

This animal has been exhibited for some months at the Crystal Palace, appears to be in good health, and has increased in size.

Mr. W. Hawkins, in the 'Illustrated News' (Supp. 20 Sept. 1856), which gives a very good figure of the animal from life, observes:—

“The three living specimens of this animal were brought to England from the Gambia, enclosed in balls of hard clay, where they had been for eight months without showing any signs of life, until those balls of hard clay were immersed in water, which caused the clay to crack and break up, discovering dark-coloured egg-like forms, which also presently burst, liberating their inmates, which briskly swam or rather dashed through the water, showing unmistakeable signs of life by feeding voraciously upon very large worms, small frogs and pieces of meat that were presented them.”

The *Lepidosiren* uses its tail to propel itself forward and upward towards the surface of the water. The subulate limbs are very much elongated; the front ones are furnished with a narrow membranaceous margin of nearly equal width the whole length of the hinder edge; the hinder one has a narrow membrane on the middle of the outer side; they are exceedingly mobile and flexible, and are used by the animal to direct its motions, and are more like feet than fins, especially when they are within reach of some fixed body which the animal can use as a fulcrum.

There are two processes on each side over the base of the anterior members, which have been regarded as gills by some authors*; they are coloured like the rest of the body, and I could not discover, even when examined by a hand-magnifier of one inch focal length, that they were pervaded by any peculiar vascular structure, or furnished with any cirri or other processes usually found on the external gills of *Batrachia*. They scarcely moved during the time that I was examining the specimen, except when the animal was swimming, when they were used like the larger members, apparently to assist in di-

* See Peters, Ann. and Mag. Nat. Hist. xvi. 318.

recting its motions, and they evidently form part of the anterior members. They are placed rather close together somewhat above the base of the elongated finned filament. These limbs are used to support the animal some height above the surface of the gravel when it is at rest.

Indeed, all the motions of the animal much more resemble those of a *Triton* or *Lissotriton* than of an eel-shaped fish.

The upper and lower surfaces of the head are furnished with lines of mucous pores placed in a symmetrical manner on the two sides, similar to the pores observable on the head and chin of different kinds of fish, and of *Tritons* and *Lissotritons*: and there is a distinct continuous line of pores, like the lateral line of fish and *Tritons*, which is continued on the tail some distance behind the base of the hinder members, but becoming less distinct at the hinder part of the series.

The eyes are of moderate size, scarcely raised above the surface, round, without any eyelids; the pupil is black, small, circular, less than one-third the diameter of the globe, with a narrow golden iris.

The Mud Fish is generally to be observed swimming about under the water, or resting at the bottom of the tank, supporting itself by its members, an inch and a half or two inches above the surface of the gravel, with its nose generally in the corner, bent down and partly hidden in the gravel.

The mouth is firmly closed by the overhanging upper lip, except in front, where there is a small oblong, transverse, horizontal opening on the outer edge of the lips, admitting the water to the small open external nostrils, which are on the middle of the under side of the upper lip. This opening does not extend to the hinder part of the lips, which are closed behind it, so that water cannot enter the mouth in that direction except through the nostrils.

In this quiescent state the lateral gill-opening is generally closed, but sometimes it is slightly elevated, and a small current appears to be emitted now and then from it, as if a small quantity of water were taken in by the nostrils and emitted by the gill-flap; but this action is not continuous nor very distinctly visible.

While remaining under the water the animal sometimes opens the mouth to its full extent, leaving it open for some time, dilating the throat by the action of the os hyoides; when fully dilated it closes its mouth, opens the gill-aperture, and contracting the throat emits a strong current of water through the lateral gill-aperture.

It occasionally but at uncertain periods rises perpendicularly to the top of the water, until the front part of the head and the whole mouth are exposed above the water; it then opens its mouth, which it retains open for a time, dilates its throat, as if taking in all the air it can contain, closes the mouth, descends under the surface and contracts its throat, as if it were forcing the air into the lungs (sometimes during this action one or two very small bubbles of air are emitted at the gill-aperture), and then the animal takes up its old position near the bottom of the vase.

I once saw the animal ascend and so take in air almost imme-

diately after it had been passing a fresh supply of water to its gills. When I have been observing it, it appeared to take in air more frequently than water *. It often rises with its body perpendicular, as if it were going to take in free air, but descends again without reaching the surface of the water.

The organs of respiration of this animal are twofold:—

1. Well-organized gills on the inner edge of the branchial arches, as in fishes, and a regular gill-cover with a small oblong aperture in front of the base of the anterior members (see Owen, *Trans. Linn. Soc.* xviii. t. 25. f. 3, t. 26. f. 1).

2. Two well-developed cellular lungs of nearly equal size (see Owen, *Trans. Linn. Soc.* xviii. t. 25. f. 3, t. 26. f. 1, 2).

3. The nostrils are close together, situated on the under side of the inner lip, with their internal opening on the side of the mouth between the lips and the outer edge of the large inner series of teeth; the passage is short, as a probe is easily passed from the one opening to the other, and the inner nostrils are very evident in the living animal when it opens its mouth to take in air.

M. Bischoff observed these interior nostrils also in the *Curamuru* or *Lepidosiren paradoxa* of the Brazils.

The animal is, therefore, provided with well-developed organs for both aërial and aquatic respiration, and its manner of breathing is perfectly conformable to this organization: it is consequently the most perfectly amphibious animal, equally adapted for living on land or in water, that has come under my observation.

The character which best separates the Batrachian—as the Toad, Frog and Salamander—from the Fish, is, that in both the larva and perfect state they are provided with an external and internal nostril, and it is through this nostril that these animals take in or emit the air which they respire; while in fish, the water which they respire is taken in by the mouth, and after passing over the gills is emitted by the lateral aperture of the gill-flap; the nostril being only a sac, without any communication with the cavity of the mouth.

When a Batrachian respire, the mouth is kept closed, the throat being used like a pair of bellows to force the air into the lungs; and if the mouth is kept open, the animal dies for want of the power of respiring. In fish, on the contrary, the mouth is always more or less open, the fish either constantly gulping in the water, then closing the mouth or lips, and emitting it by the lateral opening; or the mouth is partially open, and the animal uses its tongue and the hinder internal edge of the lip as a kind of valve, by which the cavity of the mouth is closed and the water is forced to pass through the gills.

* Mr. W. Hawkins in the 'Illustrated News' observes:—"It is seen habitually to rise to the surface of the water for a larger supply of atmospheric air, thrusting its open mouth above the surface."

Dr. Holbrook appears to have observed the same habit in the *Necturus maculosus* (which is probably the larva of the Hell-bender or *Protonopsis horrida*). He states that that animal in confinement "ascends to the surface (of the water), taking in a mouthful of air, and sinks again with it to the bottom."—*Amer. Herpet.* i. 113.

The *Lepidosirens* appear to take in water by the nostrils, and at the same time to respire both air as Batrachians and water as fish.

The generality of the Amphibia, as the Toads, Frogs, and Efts or Salamanders, are organized for aquatic respiration in their young and lower state, and for aerial respiration in their adult condition; but this animal has both kinds of organs in a state fit for perfect use at the same time, and the animal evidently uses them simultaneously.

It appears to me that the Mud-fish is much more nearly related to the Amphibia than to any fish that I am acquainted with; at the same time it evidently forms a particular group in that class.

Dr. Daniel, who has lived for several years on the Gambia and on Macarthy's Islands, informs me that the *Lepidosiren*, like the Mud-Eel or true *Siren*, is only found in the rice-fields, which are for more than half the year under water, and that they are only procured by the natives towards the end of the dry season, when they are dug out of the nearly-dried mud. They are eaten fried, and like eels have a rich oily flavour.

The habit of living in the mud is common to several Amphibia; thus the Mud-eel, or *Siren lacertina*, which has lungs and external gills, lives chiefly in mud, being dug out when the ditches of the rice-fields in Carolina are cleared. The Hell-bender or Mud-devil (*Protonopsis horrida*) and the Congo Snake (*Amphiuma*), which have internal gills and lungs and a small lateral gill-opening, live sunk in the mud often to the depth of 2 or 3 feet, especially in winter; and they and the *Siren lacertina* will live for some time out of water, and are said sometimes to leave it voluntarily.

Aquatic animals much more frequently bury themselves in the mud than is generally supposed. The common English Frogs and the large Efts bury themselves in the mud during the greater part of the winter, and this also is the case with *Dytisci* and other aquatic insects.

But some fish also, which have only gills adapted for aquatic respiration, have the same habit. Dr. Hancock observes, "When the water is leaving the pools in which they commonly reside, the Yar-row (a species of *Esox*, Linn.), as well as the round-headed Hassar (*Callichthys littoralis*), bury themselves in the mud, while all other fishes perish for want of their natural element, or are picked up by rapacious birds. The flat-headed Hassar (*Doras costata*), on the contrary, simultaneously quits the place and marches overland in search of water, travelling for a whole night, as is asserted by the Indians, in search of their object. I have ascertained by trial that they will live many hours out of water even when exposed to the sun's rays. Their motion over land is described to be somewhat like that of a two-poll'd lizard: they project themselves forward on their bony arms by the elastic spring of the tail exerted sideways; their progress is nearly as fast as a man will leisurely walk."—Zool. Journ. iv. 243.

"The Indians say that these fishes carry water within them for a supply on their journey. There appears to be some truth in this statement, for I have observed that the bodies of the Hassar do not

get dry like those of other fishes when taken out of the water ; and if the moisture be absorbed, or they are wiped dry with a cloth, they have such a power of secretion that they become instantly moist again ; indeed it is scarcely possible to dry the surface while the fish is living.”—*Loc. cit.* 243.

Dr. Hancock further observes, that a fish which he thinks is *Loricaria pleistomus* “is not only furnished with the common appendages for swimming, but also with four strong bony supporters, one attached to each of the pectoral and belly fins (*i. e.* constituting the first ray of each), by which the animal creeps on the bottom of the river, and perhaps where there is little or no water, also being as it seems partly amphibious.”—*Loc. cit.* 243.

From this account, it appears that the habits of these fish bear very little relation to those of the Mud-fish.

It is well known that many freshwater Mollusca which respire free air, and I believe some of those which are furnished with pectiniform gills for aquatic respiration, as *Paludinæ* and *Valvatæ*, in the warmer climates, such as India, where the waters of the streams or ponds are dried up, bury themselves in the mud to a considerable depth like the Mud-fish, and like them remain in a torpid state until the return of the rainy season.

Sir William Jardine has described the kind of cocoon in the clay in which the Mud-fish are brought to this country ; but I am informed by Mr. Bartlett that the cavity is always furnished with a small aperture opposite to where the nose of the animal is placed.

In referring this animal to the class of Fishes, authors have laid great stress on the fact of its being provided with a lateral line. Thus M. Duméril, in the last essay on the subject, notices the line, “which is ramified on the sides of the head as in *Chimera*,” overlooking the fact that the *Triton cristatus*, the common Eft, has similar lines on both the sides and head. He compares the gill-rays and branchial aperture to that of *Mormyrus* and *Cobitis*, but they are equally like those of *Protonopsis* ; and he compares the nostrils to those of the Lamprey, overlooking the fact that the animal is provided with nostrils communicating with the cavity of the mouth. See *Erp. Générale*, ix. 213.

I have been informed that this genus is found in other parts of Africa, as Senegal, where it is called *Tobal*, and the White Nile, from whence M. Armand sent specimens to the Paris Museum in 1843 ; and Dr. Peters found a species in Quillemannes, which Peters and J. Müller have called *Rhinocryptes amphibia*.

In reply to a note I had addressed to him, I have received the following interesting communication from Mr. Bartlett, who at the same time informed me that he intended to have communicated it to the next meeting of the Society :—

“Crystal Palace, Sydenham,
November 17th, 1856.

“DEAR SIR,—In reply to your note respecting the living Mud-fish, I beg to say that in the month of June last I received from

Western Africa a case containing four specimens of this animal; each specimen was imbedded in a block of *dry hard muddy clay*, about the size of a quartern loaf; these blocks of clay were each sewed up in a piece of canvas to prevent the clay crumbling or falling to pieces. According to the instructions I received from Capt. Chamberlayne (the gentleman who sent them), I placed them in a tank of fresh water at the temperature of 83 degrees; in doing this a portion of the clay crumbled off one of them and partly exposed the case in which the animal was contained; I was watching the operation when suddenly the *case or cocoon* rose to the surface of the water. I at first thought the animal contained in it must be dead, but I shortly afterwards observed a slight motion: apparently the animal was endeavouring to extricate itself, and this it soon afterwards accomplished by breaking through the side of its tough covering; it swam about immediately, and by diving into the mud and clay, which by this time had become softened, rendered it difficult to make further observations; I removed the case or cocoon, which still floated, and which I now send for your examination. On the following morning I found that two more of the animals had made their appearance; their cases however were not to be seen—they evidently remained imbedded in the soft clay. In the course of the next day the fourth animal suddenly floated to the surface enveloped in its case; as it showed no signs of life I removed it, and found the animal had been dead some time, as it was much decomposed. At the time these animals first made their appearance they were very thin, and about 9 inches long; they began to feed immediately upon *earth-worms, small frogs, fish, &c.*, occasionally taking raw flesh. I saw them sometimes attack each other, and one of them (I imagine in endeavouring to escape) leaped out of the tank into the large basin in the Crystal Palace in which the tank was standing (this specimen is still at large among the water-lilies, &c.). The remaining two lived together for some time, apparently on good terms; but in the month of August the one now remaining in the tank seized its companion and devoured nearly half of it, leaving only the head and about half the length of its body. In feeding, this creature masticates the food much, frequently putting it forward almost quite out of its mouth and then gradually chewing it back again, and often (when fed upon raw flesh), after having so chewed it for some time, it will throw it out altogether. The growth of these animals is most extraordinary: in June, as I have before stated, they were about 9 inches long; in three months they attained their present size, which cannot be less than 18 inches in length. It rises frequently perpendicularly to the surface to breathe, and at other times it supports itself on its fin-like appendages, and with the aid of its tail raises its body from the ground, the fins being bent or curved backwards. The movement of this animal is generally very slow, and would give one an idea that it was very sluggish; this however I have good reason to know is not the case, as in attempting to capture the one at liberty in the large basin it darted away with the rapidity of an arrow. I have reason also to believe the animal finds its food as much by *scent as sight*. With

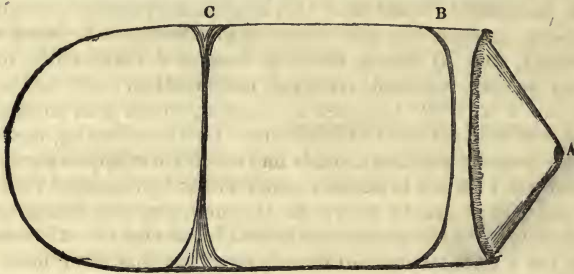
reference to the cocoon which I herewith send for your examination, the end covering the nose of the animal is rather pointed, and has an aperture about the size of a pin's head, which I have no doubt enables the animal to breathe during its state of torpor. The animal when in its case is coiled nearly twice round, and I observed in each of the blocks of clay a small hole about the size of a mouse-hole, which was quite smooth on the inside, as though the animal had crept through it.

"I am, dear Sir,

"Faithfully yours,

"A. D. BARTLETT."

Cocoon of the Mud-fish (Lepidosiren annectens).



A. Breathing-hole at nose.

B. A thin partition.

C. An attaching band that passes through the space where the animal bends, as in *a*, fig. D.

Fig. D.



D. A sketch of the animal in the cocoon.

a. The position of the band C.

b. The head, nose and eyes.

July 8, 1856.—Dr. Gray, F.R.S., in the Chair.

ON SOME NEW SPECIES OF BIRDS COLLECTED BY M. AUGUSTE SALLÉ IN SOUTHERN MEXICO. BY PHILIP LUTLEY SCLATER, M.A., F.Z.S.

1. *CERTHIOLA MEXICANA.*

Nigricanti-fusca : capite, alis caudaque nigris : superciliis et speculo alari albis : uropygio flavicante : gutture cinereo : abdomine flavo ; crisso albidiore : reatricibus extimis albo terminatis.

Long. tota 3·8, alæ 2·1, caudæ 1·2.

Sallé, no. 114. Some of the various local races of *Certhiola flaveola* certainly show such differences as entitle them to specific separation. The present bird does not appear to be quite the same as any of the nine given by Prince Bonaparte in his 'Notes Orn.' p. 51.

It is very closely allied to the Bogota species, which I believe to be the *C. luteola*, Cab., but may be distinguished by its duller back, less brightly-coloured uropygium and belly, longer bill and shorter wings.

2. ANABATES RUBIGINOSUS.

Saturate brunneus; pileo obscuriore: alis extus, uropygio et cauda tota cum pectore saturate rubiginoso-rufis; gula clariore: ventre dorso concolore sed medialiter pallidiore: tectricibus subalaribus clare rubiginosis: rostro forti, crasso, recto, nigricante, basi pallida: pedibus nigricanti-plumbeis.

Long. tota 8·0, alæ 3·7, caudæ 3·3, rostri a rictu 1·2.

Sallé, no. 102. Cordova.

This fine *Anabates* is of the same strong form as *A. ferruginolentus* (Max.), but has shorter wings and rather a stiffer tail. I know of no species that resembles it much in colouring.

3. ANABATES CERVINIGULARIS.

Supra saturate brunneus; pileo nigro: dorso summo nigricante ad-umbrato: plumis medialiter pallidioribus: loris, superciliis longis et cervicis lateribus clare rufis: gutture dilutiore, pallide cervino: abdomine flavescenti-brunneo lateraliter obscuriore: alarum pennis nigris extus brunneo limbatis, subtus autem cum tectricibus subalaribus clare rufis: uropygio et crisso cum cauda tota saturate rubiginoso-rufis: rostro validiusculo, recto, corneo, basi autem flavicante: pedibus pallide brunneis.

Long. tota 7·5, alæ 3·6, caudæ 3·0.

Sallé, no. 104. Cordova.

This species is not quite so strong in form as the last, and has not so thick a bill. In colouring it somewhat resembles *A. atricapillus*, but is much larger than that bird. The sexes are coloured alike.

4. ANABAZENOPS VARIEGATICEPS.

Supra brunneus: pilei pennis olivaceis, nigro angustissime circumcinctis et scapis plumarum flavicantibus: superciliis longis rufis: loris et regione auriculari nigris: mento et gutture toto ochraceo-albidis: abdomine pallide brunneo: cauda clare rubiginoso-rufa: tectricibus subalaribus flavicanti-ochraceis: rostro pallide corneo, basi flavicante: pedibus pallide brunneis.

Long. tota 6·0, alæ 3·3, caudæ 2·7.

Sallé, no. 204. Cordova. Sexes alike.

This bird closely resembles *Anabazenops rufo-superciliatus* (Lafr.), but may be recognized at once by the darker, browner back, and the variegated head, which in the latter species is of the same greenish brown as the back. In the present bird also there is not that decided mottled plumage on the breast observable in the other species, although there are slight indications of it on the sides of the neck.

5. XENOPS MEXICANUS.

Rufescenti-olivaceus, capite obscuriore, uropygio rufo: loris albi-

dis: stria superciliari angusta ochraceo-flavida: regione auriculari ochraceo-flavida, nigro mixta: penicilla utrinque sub regione auriculari alba: subtus dorso similis sed minus rufescens, mento et gutture medio ochracescenti-albidis: alis nigris: vitta lata per remiges cum secundariarum interiorum marginibus et terminationibus necnon secundariis dorso proximis rufis: cauda rufa: rectricibus duabus utrinque submedialibus omnino et rectricum his proximarum parte basali nigris, duabus mediis et una utrinque extrema omnino rufis: rostro nigro, basi inferiore albicante: pedibus nigris.

Long. 4·6, alæ 2·7, caudæ 2·1.

Sallé, no. 115. Cordova.

Obs. Affinis *Xenopi genibarbi*, sed crassitie majore et colore subtus olivascentiore necnon gula ochracescenti-albida distinguendus. ♂ et ♀ similes.

6. SCLERURUS MEXICANUS.

Brunnescenti-olivaceus, pileo paulo obscuriore; uropygio cum cer vice et pectore antice saturate rufis: mento albescentiore: alis nigris brunneo limbatis, rectricibus nigris, marginibus externis brunnescentibus: rostro nigro; basi inferiore albicante: pedibus nigerrimis.

Long. tota 6·5, alæ 3·2, caudæ 2·2.

Sallé, no. 101. Cordova.

M. Sallé's collection contains four examples of this interesting bird, which has never previously come under my notice. One marked as a female has the bill rather longer than the others, but does not otherwise differ from them. It may be at once distinguished from the Brazilian *S. caudacutus* (to which it shows great general resemblance) by its smaller size. Hartlaub's *S. fuscus* (R. Z. 1844, p. 370) seems to be larger, and differently coloured.

7. SCYTALOPUS PROSTHELEUCUS.

Supra brunneus, dorso rufescente: superciliis longis albis: lateribus capitis nigris albo variegatis: subtus albus; lateribus cinereis, ventre imo et crisso rufescentibus: alis fusco-nigris extus rufescenti-brunneo transvittatis: tectricum apicibus albo maculatis: cauda tota nigricante et rufescenti-brunneo tessellata: rostro nigro: pedibus brunneis.

Long. tota 3·8, alæ 2·2, caudæ 1·0.

Sallé, no. 112. Cordova.

This Mexican species much resembles in colouring a Bogota bird in my collection, which I somewhat doubtfully refer to *S. griseicollis*, Lafr., but differs from it in having the lower parts cinereous and not white.

8. GRANATELLUS SALLÆI.—“*Setophaga sallæi*, Bp. et Sclater;” Bp. Compt. Rend. 1856, May.

Ceruleo-plumbeus, superciliis vix obscurioribus: litura postoculari alba: genis gulaque plumbescentibus: pectore et abdomine medio

cum crisso rosaceo-coccineis : lateribus posticè albis : alis caudaque nigricantibus, plumbeo extus marginatis : rostro crasso, paululum incurvo, nigricanti-plumbeo ; vibrissis fere nullis : pedibus pallide brunneis.

Long. tota 5·2, alæ 2·4, caudæ 2·3.

Sallé, no. 129. Cordova.

This very pretty bird, of which M. Sallé only procured a single specimen, is, I think, upon reconsideration hardly to be placed in the genus *Setophaga*, although so closely resembling many species of that genus in its style of colouring. The bill is quite different from that of *Setophaga*, and is more like that of *Nemosia*, being even thicker than in some species of the latter form, but rather more incurved. The characters given by Prince Bonaparte for his genus *Granatellus* (founded upon a bird figured in an unpublished plate of DuBus' *Esquisses Ornithologiques*) seem to agree better with this bird, and from the description of the only species of that genus (which I have never seen) I cannot help thinking that it may have something to do with the present bird. I therefore place them for the present in the same genus.

9. PARUS MERIDIONALIS.

Supra cinereus : alis caudaque nigricantibus brunnescenti-cinereo limbatis : pileo toto cum nucha, gutture et cervice antica nigerrimis : genis et capite laterali albis : abdomine cinereo brunnescente tincto ; pectore et ventre medio albidis : rostro nigro : pedibus plumbeis.

Long. tota 4·8, alæ 2·65, caudæ 2·3.

Sallé, no. 167. El Jacale.

This Titmouse is a very close ally of *Parus atricapillus* and *Parus carolinensis*. I am sorry I have not been able to compare it with authentic specimens of those species, but, as far as I can judge from Mr. Cassin's excellent synopsis of American Parinæ given in his 'Birds of California,' it would appear—as by the locality it comes from would seem most probable—to be distinct from either of those species.

From *P. carolinensis* it appears to differ in its greater size, being nearly half an inch longer than the dimensions assigned to that bird by Mr. Cassin. It would hardly seem likely that it is the same as *P. atricapillus*, which is an inhabitant of the more northern states of the Union, and the slightly inferior size and white medial line on the lower parts seem to distinguish it from that species.

10. FORMICARIUS MONILIGER.

Supra brunnescenti-olivaceus, calli lateribus et uropygio rufescentioribus, pileo nigricantiore : macula in loris triangulari alba : gutture toto nigro, infra vitta angusta rufa cincta : abdomine toto nigricanti-griseo, lateribus et crisso olivaceo perfusis : regione oculari nuda : tectricibus subalaribus ochraceis, nigro variegatis : caudæ parte apicali nigra : rostro nigro : pedibus clare brunneis.

Sallé, no. 105, ♂ et ♀ similes. Cordova.

A typical *Formicarius*, a close ally of *F. cayanensis*, *analis*, &c., but distinguished by its black throat, bordered beneath by a narrow band of rufous; white triangular spot on the lores; and other differences. It is the first of the form found to occur so far north.

11. TODIROSTRUM CINEREIGULARE.

Olivaceum: *alis caudaque nigris, flavicante olivaceo limbatis*: *orbitis antice nigricantibus*: *loris albidis*: *subtus gutture et cervice cinereis aut potius albis cinereo dense striolatis*: *pectore olivaceo*: *abdomine toto et tectricibus subalaribus flavis*: *rostro compressiusculo, crassiusculo*; *culmine carinato, incurvo*; *colore nigricante, tomis pallidis*: *pedibus pallide brunneis*.

Long. tota 3·6, alæ 1·7, caudæ 1·2.

Sallé, no. 89, ♂. Cordova.

This *Todirostrum* differs slightly in the form of the bill from the ordinary members of the genus, that part being rather thicker, and with the culmen elevated and more incurved than in the typical species of the group.

12. MUSCIVORA MEXICANA.

“*Megalophus mexicanus*, Kp.,” Bp. MS.

Brunnea: *uropygio, cauda tota et corpore subtus flavescenti-ochraceis, gutture albidiore*: *alis extus ochraceo punctatis et subtus (nisi primariorum apicibus) omnino ochraceis*: *crista ampla, aureo-flava, cærulescente aneo terminata*: *rostro productiore quam in M. regia*: *pedibus flavidis*.

Long. tota 6·0, alæ 3·3, caudæ 2·8, rostri a rictu 1·3.

Sallé, no. 78. Cordova.

M. Sallé's collection contains a single example of this interesting bird, which however was not procured by himself, and is unfortunately not in very good condition. It is probably the *Megalophus mexicanus* of Dr. Kaup, which I have seen indicated in Prince Bonaparte's MS., but which I believe is merely an unpublished name. From the common *Muscivora regia*, to which it offers a close general resemblance, it may be distinguished by its longer bill, and having the base of the crest of a paler yellower tint, and the tips with less purplish colouring.

The *Muscivora castelnauii* (*Onychorhynchus castelnauii*, Deville, R. Z. 1849, p. 56), the only other member of the genus hitherto known, from Eastern Peru, on the other hand appears to have a shorter bill and more reddish crest than the typical species.

13. TYRANNULA SULPHUREIPYGIA.

Olivacea: *pilei crista mediali flava*: *uropygio pallide sulphureo*: *alis caudaque nigris, secundariis extus brunnescente limbatis*: *subtus flavicanti-brunnea, gula et ventre medio flavis*.

Long. tota 5·2, alæ 2·8, caudæ 2·3.

Sallé, no. 84. Cordova.

Obs. Aff. *T. barbata* ex America Meridionali, sed statura majore, colore uropygii pallidior et corporis subtus brunnescentiore distinguenda.

14. ELÆNIA VARIEGATA.

Supra brunnea, olivascente tincta, marginibus plumarum pallidioribus : alis caudaque nigricantibus, illarum tectricibus extus albo marginatis : pileo et capitis lateribus nigris : crista mediali flava : superciliis a fronte circum nucham conjunctis, albis : subtus pallide flava, gutture albo, striga utrinque rictali nigra : pectore nigricante flammulato : rostro et pedibus nigris.

Long. tota 6·2, alæ 3·7, caudæ 2·6.

Sallé, no. 80. Cordova, ♂ et ♀ similes.

Obs. Affinis *Elæniæ albicollis* (Vieill.) ex America Meridionali sed crassitie majore : coloribus lætioribus.

15. PIPRA MENTALIS.

Nigra : capite toto cum nucha coccineis : mento summo tibiisque plumosis et tectricibus subalaribus flavis.

♀. *Pallide viridis, subtus paulo dilutior.*

Long. tota 4·0, alæ 2·3, caudæ 1·1.

Sallé, no. 171. Cordova.

This Manakin is a beautiful Mexican representative of *P. rubricapilla* and *P. chloromeros*. From the former it may be distinguished by its yellow thighs, from the latter by its yellow chin and under wing-coverts.

16. MYIADESTES UNICOLOR.

Hypothymis cæsia, Licht. in Mus. Berol. ?

Schistacea unicolor, subtus pallidior, ventre albicantiore : remigibus nigris, harum autem (nisi trium extimarum) basibus alula spuria partim celatis, cum marginibus ipsarum et secundariarum apicem versus externis brunnescenti-oleagineis ; hoc colore intus sub ala albidiore : cauda nigra ; rectricibus duabus mediis schistaceis, harum duarum utrinque extimarum parte apicali pallidiore et apicibus ipsis cum margine interna apicem versus albis : rostro et pedibus nigris.

Long. tota 7·5, alæ 3·8, caudæ 3·4.

Sallé, no. 150. Cordova, ♂ et ♀ similes.

This bird is certainly quite distinct from Lafresnaye's *M. obscura*, of which I possess examples from Guatimala. Judging from Audubon's plate and description it likewise would seem different from *P. townshendi*, which has been united to Lafresnaye's species, I believe quite erroneously, by Prince Bonaparte.

My impression is that the Berlin Museum specimens, marked "*Hypothymis cæsia*," are identical with the present bird ; but as I have no means of verifying that fact, and the name is merely in MS., I think it safer to give it a new appellation.

Lafresnaye's *M. obscurus* (R. Z. 1839, p. 99), of which I have examples procured near the city of Guatimala by Signor Constanca, may be recognized at once from the present species by its brown back and rufous wing-edgings.